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A PREVIOUSLY UNDESCRIBED ZOEA ATTRIBUTED TO *CALCINUS TALISMANI* (CRUSTACEA: DECAPODA: DIOGENIDAE)

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With 1 figure and 1 table

ABSTRACT. A zoea showing affinities with those of the Diogenid *Calcinus tubularis* (LINNAEUS, 1767) but with sufficient differences to indicate that it was a different species was taken in a sample from the TFMCBM/98 Cabo Verde Cruise. The only other species of this genus recorded from the area is *Calcinus talismani* and so the zoea is believed to be from this species. The members of Diogenidae Ortmann, 1892 are Crustacea named as “sedentary hermit crabs”. The larval stages of many species in this area are undescribed and it is to be expected that new descriptions can be made from material (collections) deposited in the Natural Sciences Museum of Tenerife, in some cases indicating the presence of adults of species not yet recorded from the sample area.

RESUMEN. Una zoea mostrando afinidades a las de la especie *Calcinus tubularis* (LINNAEUS, 1767), pero con suficientes diferencias para indicar que se trataba de una especie diferente, fue recolectada durante la campaña TFMCBM/98 Cabo Verde. La especie conocida para el área es *Calcinus talismani*, por lo que la zoea posiblemente pertenezca a esta especie. Los miembros de la familia Diogenidae Ortmann, 1892 son Crustáceos denominados “cangrejos ermitaños sedentarios”. Los estados larvarios de

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algunas de las especies del área de estudio no se han descrito (LINDLEY & HERNÁNDEZ, en prensa) y podría esperarse que nuevas descripciones se lleven a cabo a partir de las colecciones del Museo de Ciencias Naturales de Tenerife.

RESUMO. Os autores relatam a recolha de uma *zoea* que atribuem à espécie *Calcinus talismani* dadas as diferenças entre a espécie encontrada e *Calcinus tubularis* (LINNAEUS, 1767). Esta descoberta corresponde às expectativas dos autores, com base no desconhecimento sobre os estados larvares das espécies de crustáceos Diogenídeos na área em estudo (Cabo Verde).

INTRODUCTION

Decapods from plankton samples taken during the TFMCBM/98 Cabo Verde Cruise (supported by the O.A.M. - *Macaronesia 2000 Program*) were examined. The specimens were captured in vertical hauls (1000-0 m), both diurnal and nocturnal with identical sampling method.

The samples from the Cabo Verde Islands contained adults or post-post larval stages of the pelagic Penaeoidea (*Gennadas* sp.), Sergestoidea (*Sergestes* sp.), Oplophoridae (*Acantheephyra* sp., *Systellaspis* sp.). Larvae were much more diverse with zoea and megalopa stages of many benthic decapods, including the families Hippolytidae, Alpheidae, Stenopodidae, Palinuridae, Thalassinidae, Diogenidae, Galatheidae and Brachyura, as well as the pelagic species. Also, in addition to Decapoda the of *Amphionides reynaudii* were found (LINDLEY & HERNÁNDEZ, in press).

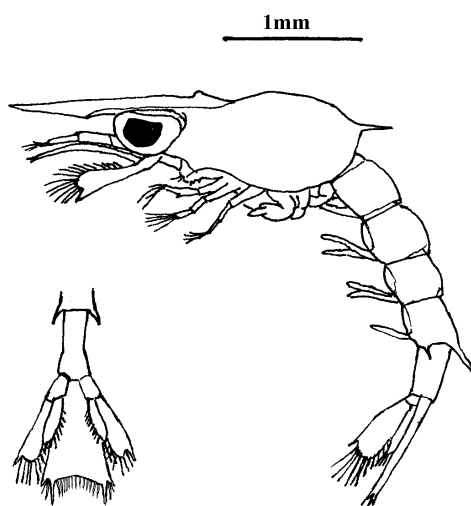


Fig. 1 - A zoea attributed to *Calcinus talismani*.

The specimen of this study (Fig. 1) was taken in the Cabo Verde Islands in the diurnal sample 24 C 98 D, with a triple no-closing net WP-2 200 μ standard for the mesozooplankton with a diameter open mouth 56 cm/by net, 6658 m³ water filtered, between 1000 m depth to surface at the station TFMCBMVCV000002 in 24° 49' 36" N and 16° 38' 90" W on date September 24, 1998.

DESCRIPTION

A last stage zoea attributed to *Calcinus* sp. (Anomura: Coenobitoidea: Diogenidae) was taken in a sample (24C 98D) from the TFMCBM/98 Cabo Verde Cruise, supported by the *Macaronesia 2000 program* of the Natural Sciences Museum of Tenerife. The presence of a median dorsal spine and a pair of lateral spines on the 5th abdominal segment and a conspicuous pair of posterior carapace spines (Fig. 1) show a very close relationship to the zoeas of *Calcinus tubularis* (LINNAEUS) (described by PIKE & WILLIAMSON, 1960 under the name *C. ornatus*). The differences between the larva taken in the Cape Verde Islands and the comparable stage larvae described by PIKE & WILLIAMSON (1960) are listed in Table 1.

TABLE 1 - Differences between *Calcinus tubularis* zoea stage V and the specimen taken in TFMCBM/98 Cabo Verde Cruise sample 24C 98D.

Characteristic	<i>C. tubularis</i> (PIKE & WILLIAMSON, 1960)	Zoea from 24C 98D
Total length	4.5mm	5.2mm
Rostrum-posterior carapace spines	2.6mm	2.8mm
Dorsal carina on rostrum and anterior part of carapace	Absent	Present
Posterior carapace spine length	Projects beyond end of 2 nd abdominal segment	Less than length of 2 nd abdominal segment
Spines on 5 th abdominal segment	Dorsal spine shorter than lateral spines	Dorsal spine longer than lateral spines
Telson terminal processes	10 + 10 (rarely 9 + 1 + 9)	10+ 1+10

DISCUSSION

Calcinus tubularis is known from the Cape Verde Islands but only one other species of the genus, *Calcinus talismani* A. Milne-Edwards & Bouvier, was recorded by FOREST (1961). Another species of *Calcinus*, *Calcinus paradoxa* Bouvier, was described from the Azores. The original description is the only record to date (UDEKEM D'ACOS, 1999) but it may be found to occur on other oceanic islands in the Atlantic.

Fourteen species in seven other genera of Diogenidae were recorded by FOREST

(1961), FOREST, J. & GARCIA RASO, J. E. (1990) and UDEKEM D'ACÓZ (1999) from the Cape Verde Islands or the coast of Senegal and nearby countries. These included *Clibanarius aequabilis* (DANA), *C. senegalensis* (CHEVREUX & BOUVIER), *Dardanus arrosor* (HERST), *D. calidus* (RISSO), *D. pectinatus* (ORTMANN), *Diogenes pugilator* (ROUX), *D. ortholepis* (FOREST), *Paguristes difficilis* (FOREST), *P. mauritanicus* (BOUVIER), *P. oxyacanthus* (FOREST), *P. rubropictus* (A. MILNE-EDWARDS & BOUVIER), *Petrochirus pustulatus* (H. MILNE-EDWARDS), *Pseudopagurus granulimanus* (MIERS), *Trizopagurus caparti* (FOREST) and *T. rubrocinctus* (FOREST & GARCIA RASO).

The described zoeas of *Clibanarius* have no posterior carapace spines or spines on 5th abdominal segment (e.g. PIKE & WILLIAMSON, 1960; BROSSI-GARCIA, 1987; SIDDIQUI *et al.*, 1993). Those of *Dardanus* have no posterior carapace spines and the 5th abdominal segment has lateral spines only with bases anterior to the posterior margin of the segment (PIKE & WILLIAMSON, 1960).

Diogenes pugilator has no posterior carapace spines, mid dorsal spines on 3rd & 4th abdominal segment; lateral and mid-dorsal spines on 5th segment (MacDONALD *et al.*, 1957). Other species of this genus, other species of this genus are similar (NAYAK & NEELAKANTAN, 1983), but in some cases there are paired dorsal spines on the 5th abdominal segment (NAYAK & KAKATI, 1977; SHENOY & SANKOLLI, 1993).

Paguristes eremita has no posterior carapace spines or spines on 5th abdominal segment of the zoeas (PIKE & WILLIAMSON, 1960). The zoeas of *P. spinipes* (MILNE-EDWARDS) have small median dorsal and lateral spines on abdominal segments 2-5 (PROVENZANO, 1978). Some species of this genus undergo abbreviated development, with the glaucothoe (megalopa) stage hatching directly from large eggs with no free living zoeal stages (MORGAN, 1987).

Pseudopagurus and *Trizopagurus* appear to be more closely related to *Diogenes* and *Clibanarius* respectively than to *Calcinus* (FOREST, 1952). It is probable that the larval morphology would reflect the taxonomic affinities.

The specimen from the sample 24C 98D is almost certainly a *Calcinus* sp. and probably *Calcinus talismani*.

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